A Blueprint for Learning
Mathematics
Sixth Grade

The ***Blueprint for Learning*** is a companion document for the Tennessee Curriculum Standards which are located at www.tennessee.gov/education. Although the curriculum adopted by the State Board of Education in its entirety remains on the web for additional reference, this reformatted version makes the curriculum more accessible to classroom teachers.

Key features of the reformatted version are:

- All grades for each content area are provided in the printed manual.
- The skills within each grade are identified as to whether they are introduced, developed, or have been mastered and are now being maintained at that level.
- The skills correlating with the state criterion referenced test (CRT) are also identified for classroom instruction.
- In the Language Arts section, the assessed skills (performance indicators) are identified not only for the state's CRT in grades 3-8 but also for the writing assessment in grades 5 and 8.
- This guide makes the planning of instruction for students with varying abilities easier to accomplish.
- Teachers can plan and work together to improve school wide student achievement through curriculum integration across content areas and grade levels.
- Teachers can identify current grade level skills as well as those needed to prepare students for the next year.

Skills are coded and identified as Introduced (I), Developing (D), State CRT and Writing Assessed (A), and Mastered and Maintained (M).

- Introduced (I) skills are new skills presented at that grade level. Even though a skill is considered introduced at a grade level, some development would also occur.
- Developing (D) skills are skills that have been introduced at a previous grade level. At this stage of development the skills are being refined and expanded.
- Assessed (A) skills are those skills that are correlated to the state performance indicators for the CRT portion of the achievement test (grades 3-8) and the writing assessment (grades 5 and 8). The identified skills are formally assessed through the CRT; however, all skills are informally assessed in the classroom.
    - For the purpose of data reporting, assessed (A) skills are grouped into categories indicating related skills and knowledge. For example, grammar, mechanics, and usage are grouped together under the grammar (G) category. Each state assessed indicator included on the Blueprint carries a legend showing that it is assessed and indicating the category in which it will be reported (e.g., Assessed/Grammar=A/G).
- Mastered and Maintained (M) indicates a skill that has been introduced, developed, and assessed. Even though a skill may be formally assessed, the development and expansion of the skill still continues.

KEY
I = Introduced D = Developing A = State Assessed M = Mastered

REPORTING CATEGORY
N = Number & Operations AT = Algebraic Thinking C = Computation R = Real World Problem Solving
DP = Data Analysis & Probability ME = Measurement G = Geometry GR = Graphs & Graphing

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MATHEMATICS
Sixth Grade

NUMBER AND OPERATIONS

The student will identify, represent, order, and compare numbers; and estimate, compute, and solve problems.

Key	Reporting Category	
A	**N**	Identify the place value of a given digit.
D		Read, write, and represent whole numbers and decimals in expanded notation.
D		Develop understanding of equivalent number representations (i.e., fractions, decimals, and percents).
A	**N**	Represent numbers using a variety of models and equivalent forms (i.e., whole numbers, mixed numbers, fractions, decimals, and percents).
A	**N**	Compare and order whole numbers, fractions, decimals, and percents using the appropriate symbol (<, >, and =).
A	**N**	Connect whole numbers, mixed numbers, fractions, and decimals to locations on the number line.
D		Demonstrate understanding of percents greater than 100 and less than one.
A	**N**	Connect ratios to a variety of models, real-world situations, and symbolic representations.
D		Identify a ratio using three forms: 3 to 5; 3/5; 3:5.
D		Determine if two ratios form a proportion, and find the missing number in a proportion.
A	**N**	Identify prime and composite numbers up to 50.
I		Develop meaning for integers using real-world examples.
I		Represent integers with concrete objects, pictures, and symbols.
D		Develop meaning for number theory concepts (i.e., divisibility, factors, and multiples).
D		Explain how arithmetic operations on fractions and decimals affect the results.
D		Use the associative and commutative properties of addition and multiplication to simplify computations with integers, fractions, and decimals.
D		Use the distributive property to simplify computations with integers, fractions, and decimals.
A	**N**	Apply order of operations when computing with whole numbers.
D		Apply order of operations when computing with decimals.
D		Use the inverse relationships of addition and subtraction and multiplication and division to simplify computations and solve problems.
D		Compute with whole numbers, fractions, decimals, and percents in problem-solving situations (e.g., mental computation, estimation, calculators, computers, and paper and pencil).
A	**N**	Compute efficiently and accurately with whole numbers, fractions, and decimals.
D		Analyze procedures for computing with fractions, decimals, and integers.
A	**R**	Solve one-step real-world problems involving whole numbers and decimals.
D		Solve one-step real-world problems involving fractions.
D		Estimate the answers to computations involving whole numbers, fractions, and decimals in real-world problems.
A	**N**	Use estimation to select a reasonable answer to a computation involving whole numbers, fractions, and/or decimals.
I		Recognize when an estimate is more appropriate than an exact answer in a variety of problem situations.
A	**N**	Select a reasonable solution to a real-world division problem in which the remainder must be considered.

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ALGEBRA

The student will analyze and use symbols to generalize patterns with, use properties of operations, and analyze change in various situations.

D		Represent, analyze, and extend geometric and numerical patterns.
A	**AT**	Extend geometric and numerical patterns.
A	**AT**	Generalize patterns in data represented in tables.
D		Generalize patterns in data represented in graphs.
A	**AT**	Apply function rules.
D		Develop an initial conceptual understanding of different uses of variables.
D		Represent mathematical statements and real-world situations using symbols.
A	**AT**	Select an equation that represents a given mathematical relationship.
A	**AT**	Evaluate algebraic expressions for a given value of the variable.
A	**AT**	Find missing addends or factors represented as variables in simple equations.
I		Model algebraic expressions using manipulatives, technology, and paper and pencil.
I		Make a graph to represent a simple real-world problem or situation.
D		Describe how changes in one quantity or variable result in changes in another.
A	**R**	Extend rate charts to solve real-world word problems.

GEOMETRY

The student will analyze and describe characteristics and properties of 2- and 3-dimensional shapes, locate and specify points on a grid, and use geometric concepts (e.g., symmetry and transformations) and reasoning to solve problems.

D		Describe, classify, and understand relationships among types of two-dimensional figures.
A	**G**	Classify two-dimensional geometric figures using properties.
A	**G**	Classify angles as acute, obtuse, right, and straight.
D		Identify and use appropriate mathematical language to describe characteristics of lines (e.g., parallel, perpendicular, and intersecting).
A	**G**	Identify parallel, perpendicular, and intersecting lines.
A	**G**	Classify quadrilaterals using their defining properties.
D		Describe similarity and congruence.
D		Plot a given set of points in Quadrant I of a coordinate system, use ordered pairs to describe or specify points, and find the distance between 2 points on the x- or y-axis.
A	**ME**	Determine the distance between two points on the x- or the y- axis in Quadrant I.
A	**AT**	Use ordered pairs to describe given points in Quadrant 1 of a coordinate system.
A	**G**	Identify the results of transformations of two-dimensional figures (e.g., slides/translations, flips/reflections, and turns/rotations).
D		Predict, and describe the results of transformations of two-dimensional figures (e.g., slides/translations, flips/ reflections, and turns/rotations).
D		Describe line and rotational symmetry in two-dimensional figures.
D		Describe a motion or a series of motions that will show that two shapes are congruent.
D		Draw two-and three-dimensional geometric figures with specified properties, (e.g., side lengths, angle measure).
D		Identify and build a three-dimensional object from a two-dimensional representation (net) of that object and vice versa (e.g., cube, rectangular prism, pyramid, cone, or cylinder).
A	**G**	Use spatial reasoning to identify the three-dimensional figure created from a two-dimensional representation (net) of that figure (i.e., cube, rectangular prism, pyramid, cone, or cylinder).
D		Use visualization and spatial reasoning (e.g., geometric models) to solve real-world problems.

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MEASUREMENT

The student will determine time, length, perimeter, area, weight, capacity, and temperature and solve real-world problems involving measurement.

D		Demonstrate understanding of both metric and customary systems of measurement.
A	**ME**	Convert from one unit to another within the same system (metric and customary).
D		Identify relationships among units within the same system (metric and customary).
D		Identify and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.
A	**ME**	Select units of appropriate size and type to measure angles, perimeter, area, capacity, volume, and weight.
D		Estimate measurements involving length, perimeter, circumference, area, and volume.
A	**ME**	Use strategies to estimate perimeter and area of rectangles.
A	**ME**	Apply formulas to determine the area of rectangles and triangles.
D		Complete investigations to develop formulas to determine the circumference of circles.
D		Determine the area of triangles and parallelograms using a formula.
D		Use a variety of manipulatives to develop formulas to determine the area of trapezoids and circles.
D		Explore surface area and volume of selected prisms and cylinders using models and manipulatives.
A	**ME**	Solve problems involving ratio and proportion.
A	**R**	Solve real-world problems involving elapsed time.
A	**R**	Solve real-world problems involving perimeter and area of rectangles.
A	**R**	Use scales to read maps.
D		Solve problems involving measurement using ratio and proportion.
D		Recognize the need for measurement precision.

DATA ANALYSIS AND PROBABILITY

The student will collect, organize, analyze, interpret, and display data in tables and graphs and determine the probabilities of outcomes in simple experiments.

D		Formulate questions, design studies, and collect real-world data.
D		Understand how data-collection methods affect the nature of the data set.
D		Examine various representations of data to evaluate how accurately the data is depicted.
A	**R**	Interpret bar and line graphs to answer questions and solve real-world problems.
D		Determine, use, and interpret measures of center and spread (e.g., mean, median, mode, and interquartile range).
A	**DP**	Determine the mean of a data set.
A	**DP**	Determine the mode of a data set.
A	**DP**	Determine the median from a stem-and-leaf-plot.
A	**DP**	Connect data sets and their graphical representations (i.e., bar graphs, circle graphs, and stem-and-leaf-plots).
A	**AT**	Make conjectures and predictions based on data (e.g., in a chart, table, or graph).
D		Explain the importance of sample size in investigations.
D		Conduct a survey using random sampling.
A	**DP**	Determine if a sample is biased.
I		Make conjectures to formulate new questions for future studies.
I		Model situations by devising and carrying out experiments and simulations.
D		Make and test conjectures about the results of experiments and simulations.
A	**DP**	Use a tree diagram or organized list to determine all possible outcomes of a simple compound event.
A	**DP**	Represent the likelihood of an event using a number from 0-1.

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